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(h) Abstract of the Disclosure.

The accuracy of certain sensors is greatly improved by improving their signal to noise ratio (SNR) in the presence of an interfering noise. Sensors were discovered which have a SNR which substantially changes when an operating parameter is selectively modulated to different magnitudes. Some noise can be practically eliminated. In the simplest form, the sensor is operated where it is both stable and close to its best SNR. This is usually faster and less costly, but the noise is never completely eliminated.

Often, the method involves operating the sensor in first one state and then another wherein the operating parameter has conditions where the sensor is stable, reproducible, and reliable, and wherein the SNRs are substantially different. The output of a state is combined with the output of another state in such a way that the noise cancels but a signal remains. Often the output in a state having greater noise is attenuated until it matches the noise content of another state having less noise. Then these outputs are subtracted. The difference is the more accurate error corrected output. In the ideal case, the difference has no noise output because the noise in the output from one state canceled the noise in the output of the other state.

However there is good signal in the difference, typically half as large as before subtraction, because the SNR in one state is preferably about double that in another state.

Unless two sensors or a combination are used, both signal and noise are constrained or conditioned to be practically constant over the time required to cycle from one state to the other and back. This is no hardship in many cases.

When it is not practical to complete a full cycle while both signal and noise are made to appear constant it may be necessary to take the difference between the outputs of two similar sensors operating simultaneously and continuously, but at differing effective magnitude of operating

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parameter so that their SNRs are substantially different. Or to build one sensor with two sectors with considerably different SNRs.

This invention has first been applied to Swain Meter® type clamp-on DC ammeters. Some results are good - the benefit in SNR is between 2 and 20, generally more like 10 times. It has also been found that at least one Hall type clamp-on DC ammeter has the essential characteristic of two substantially different SNRs at differing magnitudes of an operating parameter. We expect that better accuracy will be realized using this method.

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